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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,680	10/18/2005	Osamu Nomura	Q86054	1762
65565	7590	05/28/2010		
SUGHRUE-265550 2100 PENNSYLVANIA AVE. NW WASHINGTON, DC 20037-3213			EXAMINER HOGAN, JAMES SEAN	
			ART UNIT	PAPER NUMBER
			3752	
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			05/28/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

SUGHRUE265550@SUGHRUE.COM  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/522,680	<b>Applicant(s)</b> NOMURA ET AL.	
	<b>Examiner</b> JAMES S. HOGAN	<b>Art Unit</b> 3752	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 May 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed May 11, 2010 have been fully considered but they are not persuasive as new art is being applied.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-18 and 20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Japanese Patent No. JP 2001/105106 A to Mori et al in view of U.S. Patent No. 4,449,775 to Kimura et al.

3. As per claims 1, 2, 4, 7-9, 12, 13, and 15-18 Mori et al teaches an immersion casting nozzle (as per claim 12) with a circular molten steel flow hole portion (at (3)) in which a plurality of independent spherical-cross-section protrusion portions (as per claims 12, 15 and 16) and concave portions (4) are greater than or equal to 2 mm, with the length (L) of the protrusion or concave portion is greater than 2 times (H) in mm. Mori et al does not teach its protrusions being in any way discontinuous, or in a zigzag arrangement in both directions parallel and perpendicular (48) to a molten steel flowing direction. Kimura et al teaches (See Figure 11) "small reticulate holes" (4) on a casting nozzle that are discontinuous in both directions in a zigzag pattern (as per claim 4) parallel and perpendicular to a molten steel flowing direction. As the "holes" can

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arguably be “concave portions” that are spherical in nature (as per claims 15, 16 and it would have been obvious to one having ordinary skill in the art at the time the invention was made to have shaped and arranged the protrusions/concave portions of Mori et al as taught by Kimura et al in order to guarantee molten steel flow in any form of a nozzle that is used to work with molten metal, as the protrusions/holes of both inhibit molten metal stagnation, at even smaller amounts.

4. As per claim 2, it would further be obvious to proclaim (L), a length of a base portion to be less than or equal to  $\pi D/3$  where D is the inner diameter of the nozzle outlet, or where (as per claim 7), the protrusions and concave portions and Mori et al separated by no more than 20mm, or as per claims 8 and 9 where dimensions of a protrusion is held between 2-20 mm and the nozzle outlet hole is held to being not smaller than 4 mm as to utilize a proportional formula for a size a protrusion or concave portion size since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

5. As per claim 3, Mori et al does not teach the protrusions being 102%-350% as large as the inner surface of the inner surface of the molten steel path, however, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art and engineering logic

6. As per claim 5, Mori et al teaches protrusion portions that are apparently disposed in the whole or part of the molten steel flow hole portion of the casting nozzle.

7. As per claim 6, Mori et al does not teach, per se, the protrusions not being higher than a meniscus (understood to be a water level present, as per page 14 of the Specification) of the nozzle, as the Figures of Mori et al do not depict a water level, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have proclaimed the water level as a variable of the nozzles usage, and therefore as a Mechanical expedient. It's obvious to one skilled in the art to use routine experimentation to arrive at optimum values (i.e. the water level) to meet the needs of the user for the environment in which the apparatus is to be used as such would be a choice of mechanical expedients.

8. As per claim 10, Mori et al does not teach angled protrusions. However, the dimples depicted of concave portions of in a direction parallel to molted steel flow in the invention of Kimura et al, have the potential to be at or about 60°, however, since it has been held that discovering a result effective variable (i.e. the angle of the protrusions) involves only routine skill in the art and engineering logic. Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have shaped and arranged the protrusions of Mori et al as taught by Kimura et al in order to guarantee molten steel flow in any form of a nozzle that is used to work with molten metal, as the protrusions/concave portion of both inhibit molten metal stagnation.

9. As per claim 11, the protrusions of Mori et al are integrated with the body of the casting nozzle.

10. As per claim 14, the modification of Mori et al in view of Kimura et al as explained in claim 1 above would create discontinuous cross-section segments.

11. As per claim 20, no discernable mechanical or structural difference between the nozzles of Mori et al or Kimura et al is achieved in claiming as “stationary” nozzle. A recitation of the intended use of the claimed invention (i.e. the nozzle being “stationary”) must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, it meets the claim.

12. Claims 19 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Japanese Patent No. JP 2001/105106 A to Mori et al in view of U.S. Patent No. 4,449,775 to Kimura et al and further in view of U.S. Patent No. 4977950 to Muench.

13. As per claim 19, neither Mori et al or Kimura et al teach an inner diameter of the nozzle before the protrusions having an invariable value in a direction parallel to the flow of fluid through it. However, Muench teaches (See Figure 3) at a portion at its top (46a) before any protrusions, is a portion having a substantially invariable value (tapered) in a direction parallel to the fluid flow. Such that, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nozzle of Mori et al with the tapering of Muench in order to assist in inhibiting a spill of fluid flow.

### ***Conclusion***

14. The newly discovered prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows:

U.S. Patent No. 4,746,038 to Ohwada et al

Japanese Patent No. JP 2007167869 A to Taniguchi

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. H./  
Examiner, Art Unit 3752  
05/18/10

/Len Tran/  
Supervisory Patent Examiner, Art Unit 3752